Remarks

Reconsideration of this Application is respectfully requested.

Status of the Application and Claims

Upon entry of the foregoing amendments, claims 1-8, 11-18, and 36-41 are pending in the application, with claims 1, 11, 36 and 41 being the independent claims. Claims 1, 8, 11, 18, 36 and 41 are amended herein. Claims 20-26 and 28-34 previously were cancelled. Claims 9, 10, 19, 27 and 35 previously were withdrawn from consideration pursuant to a restriction requirement.

Summary of the Office Action

In the Official Action, claims 1-7, 11-17 and 36-41 were rejected under 35 U.S.C. § 102(a,e), as allegedly anticipated by U.S. Patent No. 6,049,777 (Sheena), and claims 8 and 18 were rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Sheena in view of J. Schwinger, "The Geometry of Quantum States", Proceedings of the National Academy of Sciences of the United States of America, February 15, 1960 ("Schwinger").

Reconsideration and withdrawal of the rejections respectfully are requested in view of the above amendments and the following remarks.

Rejection under 35 U.S.C. § 102

The rejection of claims 1-7, 11-17 and 36-41 under 35 U.S.C. § 102(a,e), as allegedly anticipated by U.S. Patent No. 6,049,777 (Sheena) respectfully is traversed. Nevertheless, without conceding the propriety of the rejection, claims 1, 11, 36 and 41 have been amended to recite more clearly various novel features of the claims, with particular attention to the Examiner's comments. Support for the amendments may be

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found throughout the original application, for example, lines 11-13 of page 9. No new matter has been entered.

Initially, Applicants note the Examiner's response to Applicants' previously-submitted arguments on pages 2-4 of the Office Action, in which the Examiner continues to characterize Sheena as teaching or suggesting the features recited in claims 1 and 11. Applicants disagree and traverse the rejection for the reasons stated below.

Anticipation under 35 U.S.C. § 102 requires showing the presence in a single reference disclosure of each and every element of the claimed invention, arranged as in the claim. See *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick,* 221 U.S.P.Q. 481, 485 (Fed. Cir. 1984).

Claims 1, 11, 36, and 41

Sheena does not disclose each and every limitation of independent claims 1, 11, 36 and 41. For example, claim 1 recites a method comprising, *inter alia*:

> generating a sparse unary ratings matrix from a user's selected preferences, wherein said user's selected preferences are represented as binary data entries in said sparse unary ratings matrix, *wherein each binary data entry has a value of either zero or one*; [and]
>
> forming a plurality of data structures representing said sparse unary ratings matrix;

In another aspect, independent claim 11 similarly recites a method comprising, *inter alia*:

> generating a sparse unary ratings matrix including ratings data represented as binary data entries, *wherein each binary data entry has a value of either zero or one*;
>
> [and]

forming a plurality of data structures representing said sparse unary ratings matrix;

In another aspect, independent claim 36 similarly recites a method comprising, *inter alia*:

receiving a runtime recommendation model from a second recommendation system, wherein the runtime model is formed from a plurality of data structures representing a unary array of entries that can be arithmetically manipulated, wherein data in the unary array of entries is binary data, *wherein each binary data entry has a value of either zero or one*, and wherein a majority of the entries in the array are zero;

In another aspect, independent claim 41 recites a method comprising, *inter alia*:

retrieving a unary array of entries that can be arithmetically manipulated, wherein data in the unary array of entries is binary data, *wherein each binary data entry has a value of either zero or one*, and wherein a majority of the entries in the array are zero;

The instant specification defines a unary ratings matrix as "a collection of numerical values indicating a relationship between a plurality of clients and a plurality of items" wherein the ratings values are one if a client votes favorably for an item or zero otherwise (page 9, lines 10-16). Applicants' data structures and matrices are unary in nature and are populated as a direct result of the binary decision trees from which the data structures are built.

In contrast, Sheena builds data structures that are not unary and are not a direct result of binary inputs by a user. Although Sheena may disclose that "item profile data and user profile data may be stored as a matrix of values which provides user profile data" (Sheena col. 5, lns. 8-9 and FIG. 2), Sheena fails to teach or suggest forming a plurality of data structures representing a sparse unary ratings matrix,

wherein each binary data entry has a value of either zero or one, as recited in claims 1, 11, 36 and 41. In contrast to the above-recited binary data values in unary ratings matrices and data structures that are either one or zero, Sheena discloses a system and method having different information entries. Specifically, Sheena teaches that "additional information associated with each *item-rating pair* can be used by the system for a variety of purposes" (Sheena, col. 5, lns. 18-20). Sheena lacks any teaching or suggestion that a sparse unary ratings matrix contains binary data values that are either zero or one, as recited in claims 1, 11, 36 and 41.

In contrast to the above-noted distinguishing features of claims 1, 11, 36 and 41, Sheena discloses a rating matrix comprising "user profiles" "user profile data" together with "item profiles" and "item profile data" (Sheena, col. 5, lines 5-9). In particular, Sheena teaches that "as with user profiles, item profiles may also be stored as an array of pointers" and that "Item profiles may be created when the first rating is given to an item or when the item is first entered into the system" (Sheena, col. 4, line 65-col. 5, line 2). Thus, Sheena's user profiles and item profiles are not the result of binary decisions made by the user, but instead are built from profile data entered by the user. In describing the profile process, Sheena teaches "the user simply submits a list of items and ratings assigned to those items" (Sheena, col. 4, lns. 7-9). Sheena discloses that "ratings for items which are received from users can be of any form that allows users to record subjective impressions of items ... For example, items may be rated on an alphabetic scale ("A" to "F") or a numerical scale (1 to 10)" (Sheena, col. 4, lines 21-25). Thus, Sheena describes a rating system in contrast to binary decision systems and methods wherein unary ratings matrices and arrays are comprised of

binary data ratings entries, wherein each entry has a value of either zero or one, as recited in claims 1, 11, 36 and 41.

Nor would it have been obvious to one of ordinary skill in the art at the time the invention was made to modify Sheena to achieve the claimed invention. For example, claim 1 recites a method of preparing a recommendation, including "providing a sparse unary ratings matrix from a *user's selected preferences*" (emphasis added). The ratings matrices and arrays recited in claims 1, 11, 36 and 41 are built from binary user inputs, such as purchasing decisions and expressing a favorable interest in items (page 9, lines 14-17). Sheena characterizes such a system as "content-based filtering," wherein "the content-based filter selects items...based upon correlations between the content of the item and the user's preferences," and "the items to be selected must be in some machine-readable form" (Sheena, col. 1, lines 49-55).

Sheena teaches that such a content-based filtering system/method is unsatisfactory. For example, Sheena states that "even the best content-based filtering schemes cannot provide an analysis of the quality of a particular item as it would be perceived by a particular user" (Sheena, col. 1, line 66-col. 2, line 2). Further, Sheena concludes that a content-based filtering scheme "generally cannot further refine the list of selected items" (Sheena, col. 2, lines 4-6). Thus, Sheena teaches away from using a content-based filtering system or method, as recited in claims 1, 11, 36 and 41 of the present application.

As Sheena teaches away from what is recited in claims 1, 11, 36 and 41, Sheena cannot be used to establish a prima facie case of obviousness. See, M.P.E.P.

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§§ 2141.02 and 2145(X)(D)(2); *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988); *Bausch &*

Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 230 U.S.P.Q. 416 (Fed.

Cir. 1986) (stating a reference should be considered as a whole, and portions arguing

against or teaching away from the claims much be considered); *Gillette Co. v. S.C.*

Johnson & Son, Inc., 919 F.2d 720, 16 U.S.P.Q.2d 1933 (Fed. Cir. 1990) (stating the

closest prior art should not be used because the closest prior art "would likely

discourage the art worker from attempting the substitution suggested by the

[inventor/patentee]."); *In re Gurley*, 27 F.3d 551, 31 U.S.P.Q.3d 1130 (Fed. Cir.

1994) ("A reference may be said to teach away when a person of ordinary skill, upon

reading the reference, …would be led in a direction divergent from the path that was

taken by the applicant."); *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366

(Fed. Cir. 1997) (stating a prima facie case of obviousness may be rebutted by

showing that the art, in any material respect, teaches away from the claimed

invention).

For at least these reasons, independent claims 1, 11, 36 and 41 are allowable

over Sheena.   Reconsideration and allowance of claims 1, 11, 36 and 41 is

respectfully requested.

Claims 2-7, 12-17 and 37-40 depend from claims 1, 11 and 36, respectively,

and are believed allowable for the same reasons. See, *In Re Fine*, 837 F.2d 1071

(Fed. Cir. 1988), and M.P.E.P. § 2143.03. Moreover, each of these dependent claims

recites additional features in combination with the features of its respective base claim

and is believed allowable in its own right. Individual consideration of the dependent

claims respectfully is requested.

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Rejection under 35 U.S.C. § 103

The rejection of claims 8 and 18 under 35 U.S.C. § 103(a), as allegedly unpatentable over Sheena in view of J. Schwinger, "The Geometry of Quantum States", Proceedings of the National Academy of Sciences of the United States of America, February 15, 1960 ("Schwinger"), respectfully is traversed. Nevertheless, without conceding the propriety of the rejection, claims 8 and 18 have been amended to clarify the claim language, and thereby to improve their form. No new matter has been added. Moreover, Applicants submit that the proposed amendments do not narrow the scope of the claim.

The Examiner concedes that Sheena does not disclose a mapping step comprising multiplying unary ratings matrices by a mappings matrix between said unary ratings matrices and a pluarlity of categories, as recited in claims 8 and 18 (see page 9 of the Office Action).

Schwinger is cited for its allegedly teaching a mapping step comprising multiplying unary ratings matrices by a mappings matrix between said unary ratings matrices and a plurality of categories.

Without conceding the propriety of the Examiner's characterization of Schwinger, Applicants submit that Schwinger fails to disclose or suggest at least the above-discussed features of claims 1, 11, 36 and 41 relating to a unary data structure including binary data entries, wherein each entry has a value of zero or one, and thus fails to remedy the deficiencies of Sheena or add anything to Sheena that would have made obvious the claimed invention.

Further, as discussed above, as Sheena teaches away from a method as recited in claims 1, 11, 36 and 41. Accordingly, Sheena cannot be used in combination with Schwinger to establish a prima facie case of obviousness.

Conclusion

Applicants believe that the present Amendment is responsive to each of the points raised by the Examiner in the Official Action, and submit that the application is in condition for allowance. Favorable consideration of the claims and passage to issue of the application at the Examiner's earliest convenience earnestly are solicited.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Respectfully submitted,

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